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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 853,833	05 10 2001	Salvatore Leonardi	856063.694	6456

500 7590 05 31 2002

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EXAMINER

ANDUJAR, LEONARDO

ART UNIT PAPER NUMBER

2826

DATE MAILED: 05 31 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/853,833

Applicant(s)

LEONARDI, SALVATORE

Examiner

Leonardo Andújar

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 15 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-8 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-8 and 17-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1-8 and 18-20) in Paper No. 7 is acknowledged.

***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Italy on 05/11/2000. The certified copy of the priority document has been received.

***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "1" has been used to designate both substrate and buried region. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show active component integrated in intervening regions between the plurality of trenches as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear if the isolation well comprises a plurality of trenches or if a plurality of trenches are in contact with a buried layer that is located at the edges of the isolation well.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-8, 17, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer (US 5,665,633).
10. Regarding claim 1, Meyer (e.g. fig. 14) shows an integrated device comprising:
- A buried layer e.g. 1124;
  - An isolation structure 132 adapted to define a plurality of isolation wells for integrating the components of the integrated device;

- A plurality of dielectrically insulated trenches 136 filled with of a conductive material 138.

11. The filled trenches form a plurality of contact regions to buried regions. Meyer discloses an epitaxial layer formed on the substrate (col. 3/lis. 17-29). Also, Meyer shows that the buried regions include the substrate and the buried layer.

12. Regarding claim 2, Meyer shows that the dielectric trenches are formed at the edges of the isolation wells in contact with the buried layers (see 1112 and 1162 regions).

13. Regarding claim 3, Meyer shows that the trenches are formed in intervening areas between adjacent isolation wells in contact with the substrate.

14. Regarding claim 4 (as understood), Meyer shows that the plurality of trenches are in contact with the buried layer located at the edge of the isolation wells (e.g. 1124 and 1162).

15. Regarding claim 5, Meyer shows that the intervening area between isolation wells includes a plurality of trenches in contact with the substrate.

16. Regarding claim 6, Meyer shows that the plurality of trenches comprise dielectric region surrounding the contact regions.

17. Regarding claim 7, Meyer shows that active components integrated in the intervening regions between the plurality of trenches (col. 4/lis. 39-41).

18. Regarding claim 8, Meyer shows that the isolation structure contacts the buried regions of high or low voltage active components of the integrated device.

19. Regarding claim 17, Meyer (e.g. fig. 14) shows an isolation trench structure comprising:

- A substrate having a buried layer e.g. 1124;
- A dielectrically insulated trench 136 from in intervening areas 132 between a plurality of isolation wells.

20. The dielectrically insulated trench is located at the edges of the isolation wells. Also, the trench comprises a central contact region 138 surrounded by insulation dielectric regions 136. Meyer discloses an epitaxial layer formed on the substrate (col. 3/lis. 17-29). Moreover, the central contact region in contact with the buried layer via the insulating layer 136.

21. Regarding claim 18, Meyer shows that the central contact region is formed of electrically conductive material (col. 6/lis. 24-26).

22. Regarding claim 20, Meyer shows isolation trench structure formed in a semiconductor substrate having a buried region, comprising: an isolation structure 132 formed in the substrate to define a plurality of isolation wells. The isolation structure comprises a plurality of trenches 136, each trench having sidewalls lined with an insulating dialectic material to define a central cavity (col. 6/lis. 22-23). Also, Meyer shows a conductive material 138 filling the central cavity an in contact with one of the substrate.

#### ***Claim Rejections - 35 USC § 103***

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer (US 5,665,633).

25. Meyer discloses most aspects of the instant invention including a contact region made of a conductor or a semiconductor (col. 6/lls. 24-26). However, Meyer does not disclose that the contact region comprises doped polysilicon. Nonetheless, the use of doped polysilicon for electrical contact is within the general skill of a worker in the art (e.g. col. 5/lls. 31-33). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use doped polysilicon to make the contact region, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hashimoto (US 5,557,135) disclose structures and procedures similar to the instant invention.

26. Papers related to this application may be submitted directly to Art Unit 2826 by facsimile transmission. Papers should be faxed to Art Unit 2826 via the Art Unit 2826 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November

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1989). The Art Unit 2826 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2826 Fax Center is to be used only for papers related to Art Unit 2826 applications.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Leonardo Andújar** at **(703) 308-0080** and between the hours of 9:00 AM to 5:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Leonardo.Andujar@uspto.gov](mailto:Leonardo.Andujar@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn, can be reached on (703) 308-6601.

28. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 305-3900**.

29. The following list is the Examiner's field of search for the present Office Action:

Field of Search	
U.S. Class / Subclass (es): 257/501,505,506 and 520	05/02
Other Documentation:	
Electronic Database(s): East (USPAT, US PGPUB, JPO, EPO, Derwent, IBM TDB)	05/02

**Leonardo Andújar**

Patent Examiner Art Unit 2826

LA

5/27/02

*[Signature]*  
FETSUM ACHIAWAM  
PRIMARY EXAMINER